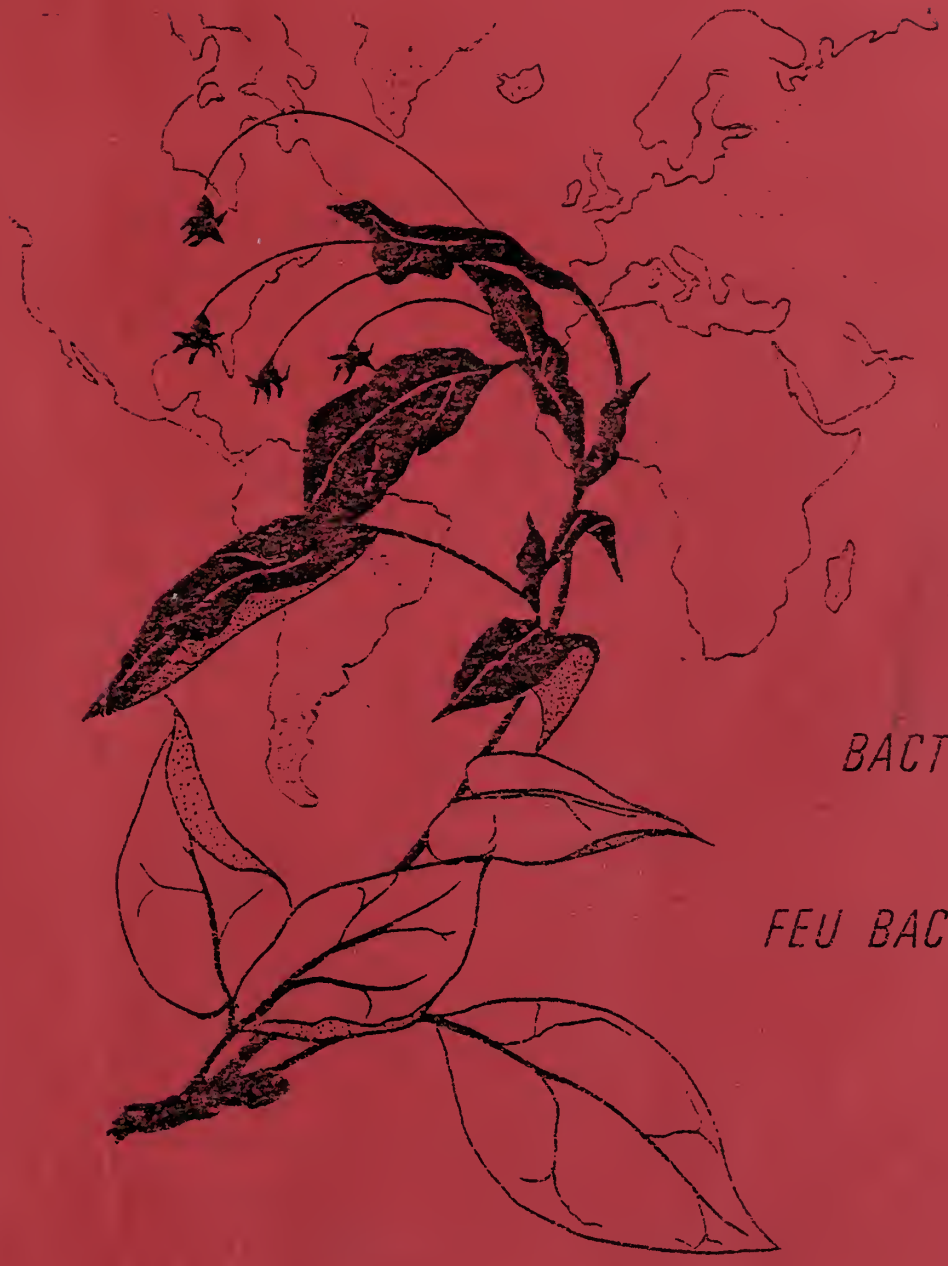
NEWSLETTER

JANUARY 1982



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FIRE BLIGHT

FEUERBRAND

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INTERNATIONAL WORKING GROUP

ON FIRE BLIGHT RESEARCH

INTERNATIONAL WORKING GRO[illegible] ON FIRE BLIGHT RESEARCH

NEWSLETTER

from the

Plant Protection Commission

International Society for Horticultural Science

in cooperation with

U.S. Deciduous Tree Fruit Disease Workers

and

European & Mediterranean Plant Protection Organization

JANUARY 1982

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service

Appalachian Fruit Research Station
Kearneysville, West Virginia, USA

Letter from the Editor

It is with great sadness that I must report the passing of 4 members of our Working Group since the 1981 edition of the newsletter. These members are Drs. John Gilpatrick, Bill Moller, and Ken Parker from the USA, and Dr. Maria de Lourdes d'Oliveira from Portugal. Our sincere sympathies are extended to their families, friends, and colleagues.

Last year we again experienced an increase in interest in fire blight as the total membership went up to 240 persons. Today, we have 50 contact persons in 29 countries, though only 12 countries officially have the disease.

During 1981, new occurrences of fire blight or detections of the causal organism, Erwinia amylovora, have been reported from several new locations in Western Europe, more so than during the past 3 years. This should really be no surprise to anyone who understands the nature of this disease, especially the numerous ways in which the causal organism can manifest itself and be disseminated. As I have mentioned before, fire blight will eventually "conquer" all of the European continent, just as it did in North America, from the eastern states to the West Coast during the 19th century. It is, therefore, rather ridiculous and unwarranted to apply unusually strict quarantine measures between countries, based on the discovery of a few bacterial cells on dormant plant material. All orchards and nurseries in regions with "established" fire blight should practice and apply all necessary sanitation and control measures so they may ship clean plant material. On the other hand, all regions or countries still free of fire blight, should maintain efficient plant introduction stations for quarantine observations and keep a close watch through their respective Plant Protection Service organizations. In the interest and concern of every individual fruit grower and each country alike, it is therefore important, and absolutely essential, that new outbreaks of fire blight, especially in new areas or regions, be reported promptly and with full details, so that eradicative measures can be taken immediately. Thus, the many organizations involved such as EPPO, ISHS, and FAO can be of more useful service and respond more effectively when the facts are known.

Tom van der Zwet

Tom van der Zwet, Secretary
North American Section
International Working Group
on Fire Blight Research

NECROLOGY

William J. Moller (June 23, 1981)

Dr. W. (Bill) J. Moller was born in Adelaide, South Australia on August 5, 1936. He obtained his B.S. degree in 1959 and an M.S. degree in 1964 from the University of Adelaide, majoring in plant pathology and horticulture. In 1964, he came to the United States for further graduate study and completed his Ph.D. degree in plant pathology at the University of California, Davis in 1967. Dr. Moller returned to Australia as Senior Horticultural Research Officer in Plant Pathology with the South Australian Department of Agriculture. In the spring of 1970, California beckoned again, and Dr. Moller returned to the University of California in Davis as Extension Plant Pathologist. During the 11 years preceding his untimely death, his accomplishments in applied research and extension work with diseases of grapes and deciduous fruit and nut crops were truly outstanding. In the field of fire blight, Bill is best remembered for his important service as coordinator for a highly successful Integrated Pest Management (IPM) project in pears that involved a team of basic and applied researchers, extension personnel, pest control advisors, and growers. Combined with significant results from basic research in monitoring Erwinia amylovora in relation to spring temperatures, the end result was a new and highly effective fire blight management program for California. For all who knew him personally, Bill Moller will always be remembered for his integrity, courage, sincerity, and friendliness. He was an inspiration to students and staff, and a true friend.

Kenneth G. Parker (October 1, 1981)

Dr. K. (Ken) G. Parker was born i Little York, Indiana on March 22, 1906. He received his A.B. degree in 1928 from DePauw University and began his graduate study in the Plant Pathology Department of Cornell University in September, 1928. After a short leave of absence at the University of California in Berkeley, he returned to Cornell and was granted the Ph.D. degree in January, 1934 on his dissertation entitled, "Fire Blight--Overwintering, Dissemination and Control of the Pathogen". Following a short term as fruit pathologist at the Pennsylvania State University, Dr. Parker was appointed Assistant Professor of Plant Pathology at Cornell in July, 1934. He became Associate Professor in 1947, Professor in 1951, and Professor Emeritus upon his retirement in 1970. Professor Parker made many contributions to fruit tree pathology, especially in the field of fire blight. Three students who received advanced degrees under him and are members of our International Working Group are Drs. A. L. Jones (Michigan), N. S. Luepschen (Colorado), and E. I. Zehr (South Carolina). Ken Parker will best be remembered for his patient, knowledgable manner in which he extended his cooperative efforts to help fruit growers and county agents to diagnose, interpret, and control fruit disease problems.

John D. Gilpatrick (March 3, 1982)

Dr. J. (John) D. Gilpatrick was born in Rumford, Maine on February 24, 1924. He obtained the B.S. degree in agriculture from MacDonald College at McGill University in 1946 and an M.S. from the University of Alberta in 1948. From 1950-1952, he worked as an Associate Plant Pathologist for the government of Canada, and from 1952-1956 he was employed by the Shell Development Company in Modesto, California. In 1961, he earned the Ph.D. degree in plant pathology from the University of California at Berkeley. From 1962-1967, he worked for Chemagro Corp. In 1968, John joined the Plant Pathology Department of Cornell University's New York State Agricultural Experiment Station at Geneva. Here he became one of the leading authorities on diseases of apple and other tree fruit crops and was well-known for his research with fungicides and bactericides. At the time of his early death, Dr. Gilpatrick was an Associate Professor of Plant Pathology and was determining how to use some of the newer fungicides in integrated pest management programs.

Maria de Lourdes d'Oliveira (October 1980)

Dr. M. de Lourdes d'Oliveira was a phytobacteriologist at the Estacao Agronomica Nacional in Oeiras, Portugal. Her death was reported by Dr. J. M. S. Martins, located at the same station. No details are available.

PRESENT STATUS AND NEW OCCURRENCES OF FIRE BLIGHT

COLORADO

The Colorado fruit industry is rapidly declining, being displaced by housing and the energy boom. All the research staff has left the Orchard Mesa Research Center in Grand Junction last summer and I went into private plant pathology consulting business.

N. S. Luepschen
Meeker

DELAWARE

Fire blight incidence was minor during the 1981 growing season in Delaware. During the dormant season ('81-'82), removal of cankered twigs was hardly necessary.

S. H. Davidson
Wilmington

GEORGIA

We have had three straight dry years (10% or more deficit) and fire blight just has not been a factor.

J. M. Thompson
Byron

ILLINOIS

Blight was very severe in central and northern Illinois in 1981. This was probably due to extremely wet conditions in June and July which favored secondary spread.

The most unusual finding in 1981 was the reoccurrence of blight on thornless blackberry on our university horticulture farm. We had not seen it since 1976-77.

S. M. Ries
Urbana

MARYLAND

Minimum amount of blossom blight in western Maryland apple orchards where streptomycin was used regularly, but significant shoot blight developed in late May-early June, especially on 'Rome'. On extremely vigorous 'Romes' (3-4 ft. shoots, no Nitrogen fertilizer last 3 yrs.) new "strikes" noted as late as last week in July-first week in August.

P. W. Steiner
College Park

NEW YORK

Some severe occurrences of fire blight in 1981. The variety 'Rhode Island Greening' was most heavily infected in orchards right along Lake Ontario (within 1 mile). The bloom period along the lake lasted for 7-10 days with periods of hot humid weather and some rain. Other highly susceptible varieties were not as severely infected, probably because of slightly different bloom dates.

S. V. Beer & T. Burr
Ithaca & Geneva

After 12-15 years without serious fire blight problems in either apples or pears, Hudson Valley growers have been forced to review procedures for fire blight control. The incidence of fire blight in pears was moderate in 1980 and high in 1981 where no blossom sprays of streptomycin were used. Many growers failed to apply strep even though blight conditions were ideal during bloom. Despite a high incidence of fire blight in pears, we have seen no blossom blight in apples. In some pear orchards with blossom blight, large aphid populations contributed to blight spread to terminals through mid-summer. Growers have been tolerating higher aphid populations because Pydrin has reduced the need to spray for pear psylla.

In nearly all cases where fire blight has become a serious problem, the problem started with a single strike or two, evident during the preceding growing season. These few scattered infections apparently provide sufficient inoculum for the epidemics which developed the following year. More careful scouting to detect blight and the use of appropriate control measures could have prevented much of the damage which occurred.

D. Rosenberger
Highland

OREGON

The Medford pear district experienced a mild blight year in 1981. This apparently followed from temperatures during the bloom period staying under the 60° mean temperature until late April, while full bloom occurred in late March and early April, and pollination occurred promptly.

D. Sugar
Medford

PENNSYLVANIA

Even though fire blight was severe in 1980 following several hail storms, the disease was much lighter during 1981. There is generally more shoot blight than blossom blight. In the main apple variety 'York', fire blight moves only into 1 or 2-year-old wood. In general, control work is done after the disease becomes apparent.

K. D. Hickey
Biglerville

UTAH

Fire blight was not a problem in commercial apple or pear orchards. Some fire blight occurred later in the season on hawthorn and pyracantha.

S. V. Thomson
Logan

VIRGINIA

Fire blight comes and goes with the weather in Virginia. 'Maxine' is the best pear cultivar that I have in the planting at Blacksburg. I have never seen any fire blight associated with this cultivar during the past 16 years.

C. R. Drake
Blacksburg

WASHINGTON

In the spring of 1980, several growers were forced to remove 1/3 to 1/2 of the bearing tree surface due to the severe fire blight that developed the preceding summer. Following the severe outbreak in 1980, the fire blight situation was very spotty in the Yakima valley during the summer of 1981. Grower concern plus a cool spring helped bring the situation under control.

In the Wenatchee district more blight was observed than usual. This was due to a carryover from late infection plus a fairly heavy second bloom on

Bartletts, which occurred during a warm spell. Complicating the picture was the recent occurrence of Streptomycin resistance in the Wenatchee area.

Streptomycin resistance is now common in all Washington pear growing districts except White Salmon (across the river from Hood River).

R. P. Covey
Wenatchee

WEST VIRGINIA

Fire blight remained mild throughout the Appalachian area, except for sporadic occurrences in certain apple orchards. In general, fruit growers favor the application of Bordeaux mixture (8-8-100) or copper sulfate (4 lbs/100 gal) applied at 10-15 lbs/acre as a preventive coverage to destroy surface bacteria on the tree tissues.

J. G. Barrat
W.Va. Exper. Farm

ALBERTA

Government of the Province of Alberta
Alberta Regulation 289/78

Appendix

Fire Blight Control Regulation

1 In this regulation fire blight means the disease caused by the bacterium Erwinia amylovora.

2 Fire blight and the causal bacterium Erwinia amylovora are declared to be harming or likely to harm apple, crabapple, mountain ash, pear, hawthorn, cotoneaster, raspberry, saskatoon and stone fruits throughout Alberta.

3 Fire blight and the causal bacterium Erwinia amylovora are declared to be pests throughout Alberta.

4 A plant with fire blight or suspected of having fire blight shall be pruned to remove diseased parts to the satisfaction of an officer.

5 All wood with fire blight and dead or severely infected trees shall be disposed of to the satisfaction of an officer.

6 A plant with fire blight shall not be sold, offered for sale or distributed.

(Extract from The Alberta Gazette, July 31, 1978)

This Control Regulation is not enforced province-wide but left up to each city or municipal district. In Alberta it is enforced presently only by the city of Edmonton.

This province has an unusually high proportion of wild and cultivated rosaceous species which are cold hardy. Disease occurs province-wide and is severe in some years; occasionally very severe, even in dry seasons. The most susceptible crabapple cultivars are 'Royalty' and Malus baccata 'Columnaris'.

I. R. Evans
Edmonton

NOVA SCOTIA

Sporadic outbreaks on pears; wood canker phase only in Nova Scotia. A few reports of occurrences in 1981, but damage was insignificant. Fire blight has not been identified on apples.

R. G. Ross
Kentville

ONTARIO

Fire blight was particularly severe on several susceptible apple cultivars ('Idared', 'Jonathan', 'Lodi' and 'Tydeman's Red') in the Harrow area. Those orchards with the most fire blight were also those with much disease in 1980. The weather in 1980 was favorable for the extension of cankers at the end of the growing season. Damage to pear trees and other susceptible plant species was light.

Fire blight was not a problem in other areas of the province. It was reported on 'McIntosh', 'Cortland', 'Yellow Transparent' and 'Jersey Mac' in Eastern Ontario and Western Quebec, following a severe winter of 1980-81.

W. G. Bonn
Harrow

BELGIUM

Symptoms appeared on the following apple varieties: 'Jonagold', 'Glasker', 'Jonathan', 'Golden Delicious', and 'James Grieve'; isolated cases in the neighborhood of very infected hawthorn; no extension after removal of infected parts. Two new appearances of serious attack on pears in completely new areas without any contact with the existing infection.

W. Porreye
St. Truiden

ENGLAND

Sporadic but severe hawthorn blossom infection was seen across southern England, but most hawthorns remained unaffected. In southeast England, infection spread from hawthorns to pears in several orchards; infection occurred sometimes via summer blossoms, but sporadic shoot infections were common in 2 orchards. In previously infected orchards in the southwest, there was some primary blossom infection. Severe infection on pyracantha, cotoneaster and Sorbus aria was occasionally seen.

Field observations of fire blight were consistant with the following weather features: warm weather in May 1978-80, encouraging build up of infection on hawthorns; a few warm days in April allowing early pear blossom infection in previously affected orchards and possible prebloom infections on other hosts including hawthorns which, judging by weather analyses, were likely to be producing inoculum by full bloom on hawthorn when there was a short warm, wet period (19-20 May) followed by wet weather; alternating warm weather and storms in early July encouraging pear shoot infection.

Eve Billing
East Malling

FRANCE

In 1981, fire blight in France has been both stable and active:

1) stable, because the two zones where fire blight had been reported are still the only contaminated areas in France; surveys in all the large pear and apple growing areas and nurseries have been negative this year again, except in the already contaminated zones of the North and South West.

2) active, because in these two areas the disease is not eradicated, and has been severe, especially in summer.

North: Now the area with fire blight is roughly the part of the country included between a line Boulogne-St Amand and the Belgian border. That means an extension both eastward and southward. Nine orchards are contaminated (mainly pear orchards with 'Conference' and 'Comice'), few attacks on apple trees ('Idared') have been reported, but the most important host plant is Crataegus (hawthorn hedges).

South West:
Dax area: The disease has not been found outside its former limits. Damages were moderate in pear orchards. No symptoms in apple orchards.

Garonne Valley: Like last year, the main blossom period of pear trees has not been very dangerous, but many symptoms appeared later on early secondary blossom (May). The disease has been severe in summer, mainly on 'Passe Crassane' which is very susceptible and has very abundant summer blossoms. No attack on apple trees.

These contaminated zones are surveyed and controlled by the Plant Protection Service.

In October 1981, fire blight was detected on Cotoneaster dameri var. 'Coral Beauty' in a nursery in St. Julien en Genevois (Haute-Savoie) in eastern France near Geneva, Switzerland. These plants had been imported from the Netherlands in July 1981.

All potential host plants in the nursery were destroyed by the Plant Protection Service, even after a negative bacteriological check on these plants (IF and isolation); the surroundings are now checked at intervals for absence of E. amylovora. A special survey is planned in spring 1982. See OEPP leaflet n° RSF 442, January 1982.

NETHERLANDS

During the 1981 blossoming period of Crataegus and Cotoneaster, the weather was favorable for infection. As a result, many shrubs of these genera in the landscape and in private gardens became infected and had to be destroyed. A number of pear orchards, mainly in the old focus in the southwestern part of the country, showed shoot- or rattail infection during summer and autumn, and were destroyed by the growers. Spraying with streptomycin was only carried out in a few cases. Growers prefer sanitation.

C. A. R. Meijneke
Wageningen

WEST GERMANY

In 1981, fire blight was found for the first time in southern Germany. The disease occurred in many locations of Baden-Württemberg, at several places of the southern part of Rheinland-Pfalz and Hessen and at one site in Bavaria. Most outbreaks were observed in the upper Rhine valley between Freiburg and Mainz. Also, several foci were found in the valleys of the Neckar and Main Rivers. So far, the disease attacked mainly the late flowering ornamental Cotoneaster salicifolius floccosus. To a lesser degree it was also found on C. watereri hybrids, C. bullatus, Pyracantha coccinea, Crataegus monogyna, Stranvaesia davidiana, and

quince. Apple and pear were affected only in a few cases with the exception of a 10 ha orchard near Offenburg where both crops were heavily infected. Many pear trees had been killed. Of the pear cultivars, 'Conference', 'Bristol Cross', 'Bartlett', and 'Beurré Bosc' showed the highest susceptibility. The same was true for the apple varieties 'Yellow Transparent', 'Gloster', 'James Grieve', and 'Jonathan'.

W. Zeller & E. Seemüller
Heikendorf & Dossenheim

NEW ZEALAND

Very little fire blight observed on any host anywhere in New Zealand in 1981.

D. W. Dye
Auckland

ITALY

Up until now, no fire blight has been reported in Italy. However, a microbiological check carried out on samples of 100 buds of apple, pear and quince imported from Northern Europe in the period 1980-81, demonstrated the presence of live cells of Erwinia amylovora in a 'Jonagold' apple sample from Holland. This finding led our Ministry of Agriculture and Forestry to issue a decree from the 1st October 1981 blocking from Holland the importation of all E. amylovora host plants (Gazzetta Ufficiale Nº 254, 16th September 1981).

C. Bazzi
Bologna

SWITZERLAND

So far, no fire blight has been detected inside of Switzerland. But fire blight has reached the Swiss border (near Geneva, near Basel and close to Lake Konstanz). Most cases concern ornamental plants.

R. Grimm
Wadenswil

SWEDEN

During 1981 a survey was carried out in the southern part of Sweden as in previous years. Areas being in the risk zone of infection from Denmark, from their new spreads and locations with heavy infections, were inspected several times. Inspections also of nursery stock. No fire blight has been reported or found in 1981.

Maria Graberg
Jonkoping

IRELAND

Fire blight has not been recorded in Ireland.

P. F. Walsh
Dublin

NORWAY

Fire blight has still not been observed in Norway.

H. Roed
AS-NLH

GREECE

The disease has not been introduced in Greece.

P. G. Psallidas
Kiphissia-Athens

HUNGARY

The disease is not present in Hungary.

Z. Klement
Budapest

SOUTH AFRICA

Fire blight is not in South Africa yet.

F. N. Matthee
Bellville

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DETAILS ON CURRENT FIRE BLIGHT RESEARCH

REPORTED FROM SOME UNIVERSITIES AND EXPERIMENT STATIONS

CALIFORNIA

An interesting abstract appeared in the journal of Phytopathology entitled, "Frost damage to pear reduced by antagonistic bacteria, bactericides, and ice nucleation inhibitors" by S. E. Lindow (Univ. Cal., Berkeley). Reductions in populations of E. amylovora on pear flowers were observed in trees treated with 16 antagonists which were either aggressive colonizers of plant surfaces or were inhibitory to E. amylovora in vitro. Frost damage was correlated significantly with the number of ice nuclei present rather than the number of ice nucleating bacteria (Phytopath. 71:237, 1981).

Editor
IWGFB Newsletter

MISSOURI

The more than 10^9 dalton amylovorin molecule has been depolymerized to a 10^4 dalton molecule by an E. amylovora depolymerase and the small molecule still causes wilt as rapidly as the parent molecule and does not cause solutions at 100 μg/ml to increase in viscosity as does the parent molecule. The 10^4 dalton molecule is aggregated by the apple agglutinin, malin, just as the parent molecule is.

R. N. Goodman
Univ. of Missouri

NEW YORK

Applications of 9 strains of bacteria, not pathogenic to apple, were made to apple blossoms in the research orchard before and after inoculating the same blossoms with E. amylovora. Several strains significantly reduced the incidence of fire blight. One strain of E. herbicola applied to apple shoots prior to inoculation did not reduce the incidence of shoot blight. In both tests, reconstituted frozen suspensions of bacteria were used. In previous years, in which disease control results were more impressive, diluted log-phase cultures of bacteria had been applied to blossoms. When immature pear fruits were used, log-phase cultures were significantly more effective in suppressing fire blight than were reconstituted frozen suspensions of the same viable cell concentration. Applications of partially purified preparations of herbicolacin 112Y, a bacteriocin produced by E. herbicola active against E. amylovora in vitro, did not

significantly reduce disease incidence in the orchard, although the bacteriocin was active in an immature pear fruit tissue assay. Studies of the kinetics and mode of action of herbicolacin 112Y against E. amylovora indicated that the bacteriocin is bacteriocidal to E. amylovora only if the cultures are growing vigorously. Transposon mutagenesis indicated that genes for bacteriocin production are carried on a 96 md refractive plasmid of E. herbicola. Curing experiments indicated that genes for pigmentation and thiamine prototrophy are carried on a ca. 350 md plasmid.

S. V. Beer
Cornell University

Twenty isolates of E. amylovora originating from locations throughout North America and Europe were evaluated for their virulence on several apple cultivars by determining the mean percent shoot blight caused by inoculation of vigorously growing shoots of orchard trees. Most isolates did not differ significantly in their virulence patterns for most cultivars. However, a Canadian isolate exhibited a pathogenic specialization for the apple cultivar 'Quinte'. Further investigations have shown that this Canadian isolate is more virulent on Malus species and hybrids which have been used as sources of fire blight resistance. Pooling several different isolates of E. amylovora for resistance screening, as opposed to using a single isolate, appears to affect the observed segregation pattern for fire blight susceptibility. The variability of virulence in E. amylovora, and its importance in breeding apples resistant to fire blight, is under further investigation.

The chemical compound CGA 79038 was evaluated for its ability to control blossom blight on 7-year-old Idared/M7 apple trees. In early bloom a protective spray of test chemicals was applied to trees. Inoculation with E. amylovora occurred 24 hours following protective treatment, and an eradicative spray treatment was applied 48 hours after inoculation. The level of disease control with CGA 79038 at 100 mg/liter did not differ significantly from that obtained with Streptomycin at 100 mg/liter, although the Streptomycin performed better numerically. The percent blossom cluster infection for the given treatments was: Streptomycin 100 mg/l, 4%; CGA 79038 100 mg/l, 11%; and H_2O, 58%.

Aldwinckle & Norelli
N.Y. State Agric.
Expt. Sta.

OREGON

We intend to field-test antagonistic bacteria as they become available for testing.

D. Sugar
South. Oregon Expt. Sta.

WEST VIRGINIA

Current research projects at our station:

1. Evaluation of pear varieties, species and seedling material for resistance to fire blight, scab, leaf spots, and psylla.

2. Improve method of inoculation and screening of seedlings in the greenhouse for fire blight resistance.

3. Study the nature of the epiphytic and endophytic phases of the life cycle of E. amylovora.

4. Determine relationship in degree of fire blight resistance between cultivars and advanced selections of different ages.

T. van der Zwet
& R. L. Bell
Appalachian Fruit Res. Sta.

ALBERTA

Aside from more common hosts, the disease is usually reported annually on raspberry cultivars and Amelanchier alnifolia.

I. R. Evans
Alb. Dept. Agric.

ONTARIO

The breeding program incorporating fire blight resistance into pears will be moderated by the departure of Harvey Quamme, who transferred to the Summerland Research Station. His replacement is being recruited.

The research on epidemiology and control is continuing.

G. W. Bonn
Harrow

BELGIUM

We are following the presence of epiphytic bacteria on Cotoneaster salicifolis, Pyrus, and Crataegus in the protected areas, in order to detect the presence of infections.

W. Porreye
Res. Sta. van Gorsem

ENGLAND

Greenhouse experiments suggested that, where pear or apple twigs became infected via buds as they burst by ooze from overwintering cankers, flower clusters could be heavily infested or producing ooze by early bloom.

Mixed culture studies with variants of Erwinia amylovora continue.

Collaboration between Common Market countries continues.

Eve Billing
East Malling Res. Sta.

FRANCE

Plant Pathology Section

1. Study of the influence of the experimental sprays of streptomycin on bacteria on leaf surfaces (epiphytic bacteria and E. amylovora): resistance to streptomycin and other antibiotics, plasmids, etc. (coll. with L. Gardan).

2. Climate and fire blight in France (coll. with National Meteor. Office).

3. Chemical control.

4. Participation in breeding and germplasm susceptibility program (Pear-Apple-Ornamental).

Plant Breeding Section

1. Physiology of summer blossom of pear.

2. Breeding for resistant Pyracantha.

3. Apple and pear breeding for resistance to fire blight.

J. P. Paulin
Sta. Path. Veget.

NETHERLANDS

a. Testing of the system Billing under Dutch circumstances

In 1980 and 1981, relevant weather data were sampled at 12 locations throughout the country and in the neighborhood of orchards. The graphs according to Billing were drawn up and offered a reasonable explanation for the development of the disease in both years. In

1981, they showed already in June their predictionary value for the development of the disease for the rest of the year. It is hoped to check the system more thoroughly in the years ahead at a small field trial, which will be established in the old focus in the SW part of the country.

C. A. R. Meijneke
& M. van Teylingen
Plant Prot. Serv.

b. Screening of bactericides

The efficacy of one application with four different compounds against artificial flower inoculation was tested at an isolated field on Cotoneaster salicifolius floccosus. Kasumin (kasugamycin) and CGA 78039 (an experimental bactericide) reached the same level of effect as streptomycin (Plantomycin) and copper-oxychloride (Koper Bayer). In another preventive trial with Kasumin and Plantomycin, a noteworthy influence of the inoculum density (10^4, 10^6, and 10^8 cells/ml) was found on the level of control. Also, in this trial, Kasumin reached the same level of effect as Plantomycin.

T. Kooistra
Plant Prot. Serv.

c. Safety-period for the use of streptomycin

Trials were carried out to obtain sufficient data on streptomycin residues on apple and pear in order to find a base for shortening the present safety period of 8 weeks. A decision on the base of the data obtained has not yet been taken as the detection method used was insufficiently reliable. A better detection method, however, seems not yet to be available.

J. J. J. Langeslag
Plant Prot. Serv.

d. Screening for resistance

Seedlings of quite a number of Crataegus species, grown from seeds obtained from botanical gardens all over the world, were screened for their susceptibility to E. amylovora. All C. monogyna-type species were about as susceptible. The broad-leaved species showed less shoot-wilting, mainly because of reduced shoot elongation, being a characteristic for these species. C. phaenopyrum was resistant to young topleaf- and shoot inoculations. By testing 25-fold replicates of a number of pear varieties it was demonstrated that after topleaf inoculation the shoot-wilting-ratio depended only on the physiological condition of the individuals. The differences in ratio between

varieties may be due to the genetic characteristics of the shoot length potention. There was no indication of the presence of any resistance gene.

H. P. Maas Geesteranus
Res. Inst. for Plant Prot.

WEST GERMANY

A new antagonistic strain of E. herbicola showed a good effect on E. amylovora in vitro and after artificial inoculation of Cotoneaster bullatus in a climatic chamber.

F. A. Schulz &
M. Isenbeck
Univ. of Kiel

After addition of the relative humidity (days with more than 75% minimum score), a good fire blight prognosis could be made with the Billing system under epidemiological conditions in the north of West Germany.

Research with new chemical compounds were continued. The compound CGA 78039 also showed good results by spraying curatively in artificial inoculation experiments on shoots of Cydonia vulgaris.

W. Brulez & W. Zeller
Biol. Bundesanstalt

ITALY

Current research projects at the Phytobacteriology Laboratory:

a) Analyses of weather, with Billing's system, of the last 10-15 years in different Italian areas;

b) Careful phytosanitary inspections of material imported into Italy with bacteriological analyses of buds and leaf scars collected from symptomless plants and trees;

c) Improve diagnostic methods for a rapid identification of the pathogen.

C. Bazzi
Istit. Patol. Veget.

SWITZERLAND

We are not allowed to work with the pathogen.

R. Grimm
Res. Sta. for Fruit Growing

MISCELLANEOUS NEWS

California

I went to Bora Bora (French Polynesia) to look for fire blight on tropical hosts but could not find it. I had a false report which led me to the island of Moorea, but it was not there either. I concluded that the isolation of the islands have prevented fire blight introductions.

M. N. Schroth
Berkeley

Japan

An apparent false report about fire blight in Japan was published in the 1981 Newsletter, based on erroneous information supplied by Mr. Ichiro Okuse from Hirosaki University in Aomori Prefecture. Following a visit to Japan by Dr. L. Batra (Mycologist, USDA, Beltsville, Maryland), the closely similar symptoms observed on pear in Aomori Prefecture were caused by the fungus Diaporthe. Therefore, the Ministry of Agriculture in Japan is adhering to its announcement of March 1974 (EPPO Rept. 380) that all reports of fire blight in Japan are based on misidentifications, and that there is thus no fire blight in Japan.

FUTURE MEETINGS

1982	
Aug. 29 - Sept. 4	Twenty-first International Horticultural Congress, Hamburg, West Germany. For details, contact: Hamburg Messe und Congress GmbH, P.O. Box 302360, D-2000 Hamburg 36, W. Germany.
1983	
August 17 - 24	Fourth International Plant Pathology Congress, Melbourne, Australia. For details, contact: Dr. G. Weste, Congress of Plant Pathology, Parkville, Victoria 3052, Australia.
August	Third International Workshop on Fire Blight Research, under auspices of the Intern. Soc. for Hort. Sciences, Bordeaux, France. For details, contact: Dr. J. P. Paulin, INRA, Station Phytobacteriologie, Beaucouze 49000 Angers, France.

NEW THESES AND DISSERTATIONS ON FIRE BLIGHT

Syam, K.
"Nature and mode of action of amylovorin and EPS produced by E. amylovora in vivo and in vitro." Ph.D. Dissert., Univ. of Missouri.

Hodges, Susan S.
"Studies on the in vitro interaction of herbicolain, a bacteriocin produced by Erwinia herbicola and Erwinia amylovora."
M.S. Thesis, Cornell Univ., Ithaca, N.Y., 91 p.

Weise, Heike.
"Wichtige Bakteriosen im Obstbau-Feuerbrand und Bakterienbrand."
Ing. grad., Christian-Albrechts Univ., Kiel, West Germany, 111 pp.

Parfait, Gisele.
"Contribution à l'étude d'Erwinia amylovora agent du Feu Bactérien des rosacées." Fac. Sciences, Tours, France.

Welcker.
"Premières contributions à l'étude des floraisons secondaires chez le Poirier. Enith, Angers, France.

Locations Reporting Availability of Cultures of Erwinia amylovora for Exchange Purposes [1/]

1. Urbana, Ill. - Ries, S. M.
2. Ithaca, N.Y. - Beer, S. V.
3. Harrow, Ont. - Bonn, G. W.
4. East Malling, Eng. - Billing, Eve
5. Wageningen, Neth. - Maas Geesteranus, H. P.
6. Angers, France - Paulin, J. P. (60 strains)
7. Bologna, Italy - Bazzi, C. (Strain IPV-BO 8A-1 = NCPPB 3159) [2/]
8. Auckland, N.Z. - Dye, D. W. (40 clusters, incl. type strain, from many hosts and many countries)

[1/] These locations are in addition to those listed in previous issues of the Newsletter.

[2/] NCPPB = Nat. Coll. of Plant Path. Bacteria, Harpenden, England.

NUMBERING AND HEADINGS OF CARD AND REPRINT COLLECTION OF FIRE BLIGHT LITERATURE AT THE APPALACHIAN FRUIT RESEARCH STATION

Kearneysville, West Virginia

I - XI United States

Numbering	Heading
I-A	Bulletins and Circulars
I-B	Distribution and Losses
I-C	Host Specificity
II-A	Early History (1170 - 1870)
II-B	Early History (1871 - 1900)
II-C	Early History (1901 - 1910)
III	Bacteriology
IV	Etiology
V	Entomology
VI	Epidemiology
VII	Biochemistry
VIII	Host Nutrition
IX	Chemical Control
X	Eradication - Pruning
XI	Nature of Resistance
EL	Extension Leaflets

XII and XIII Foreign Countries

Numbering	Headings	Numbering	Headings
XII-A	Canada	XIII-A	Russia
B	New Zealand	B	Turkey
C	Australia	C	Israel
D	Japan	D	Jordan
E	China (P. Rep.)	E	Egypt
F	Netherlands	F	Rhodesia
G	England	G	South Africa
H	Denmark	H	India
J	Sweden	J	Pakistan
K	Norway	K	Vietnam
L	West Germany	L	Mexico
M	East Germany	M	Guatemala
N	Austria	N	Chili
O	Switzerland	O	Argentina
P	Poland	P	Brazil
Q	France	Q	Portugal
R	Belgium	R	Bermuda
S	Luxemburg	S	Taiwan
T	Italy	T	
U	Spain	U	
V	Czechoslovakia	V	
W	Yugoslavia	W	
X	Hungary	X	
Y	Romania	Y	
Z	Bulgaria	Z	Miscellaneous

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the Additional Bibliography or Newsletter Jan. 1980 and 1981)

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III-202 Ishimaru, C. A. and E. J. Klos. 1981. Improved differential medium for detection and enumeration of Erwinia amylovora. Phytopathology 71:228 (Abstr.).

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Preiser, F., Research Laboratories, Merck and Company, Inc., Bldg. R123-12, Rahway, New Jersey 07065. (201-574-6687)	(2)	USA
Prillwitz, H. G., Landespflanzenschutzamt, Essenheimerstr. 144, 6500 Mainz - Bretzenheim, West Germany.	(3)	BRD

Psallidas, P. G., Benaki Phytopath Inst., Kiffissia, Athens, Greece. (01-8013619)	(3)	GRC
Quamme, H., Canada Agriculture, Research Station, Summerland, Brit. Columbia V0H 1Z0, Canada. (604-494-7711)	(2)	CND
Rackham, R. L., Oregon State Univ. Extension Service, 1301 Maple Grove Drive, Medford, Oregon 97501. (503-776-7371)	(1)	USA
Reimann-Philipp, R., Bundesforschungsanstalt fur Gartenbauliche Pflanzenzuchtung, Bornkampsweg, 2070 Ahrensburg, West Germany. (04102-51122)	(1)	BRD
Richter, J., Landesamt fur Pflanzenschutz, Reinsburgerstrasse 107, 7000 Stuttgart-1, West Germany.	(2)	BRD
Ride, M., Station de Phytobacteriologie, I.N.R.A., Route de St. Clement, Beaucouze 49000, Angers, France. (41-88.22.00)	(3)	FR
Ries, S. M., Department of Plant Pathology, University of Illinois, N-427 Turner Hall, 1102 S. Goodwin, Urbana, Illinois 61801. (217-333-1523)	(1)	USA
Ritchie, D. F., Department of Plant Pathology, N. C. State University, Raleigh, North Carolina 27650. (919-737-2721)	(2)	USA
Roed, H., The Norwegian Plant Protection Institute, 1432 As-NLH, Norway.	(3)	NOR
Rom, R. C., Room 316, Plant Science Bldg. Univ. of Arkansas, Fayetteville, Arkansas 72701. (501-575-2604)	(2)	USA
Roosje, G. S., Research Institute for Plant Protection, Binnenhaven 12, P. O. Box 42, 6700 AA Wageningen, The Netherlands. (08370-19151, ext. 228)	(2)	NL
Rose, E., Hoechst AG, Landwirtsch. Entwicklungsabteilung, Prufstelle Nord, Karl Wiechert Allee 3, 3000 Hannover 61, West Germany. (0511-5700.245)	(2)	BRD
Rosenberger, D. A., New York Agric. Exp. Station, Box 727, Highland, New York 12528. (914-255-8678)	(2)	USA
Ross, R. G., Canada Agriculture, Research Station, Kentville, Nova Scotia B4N 1W2, Canada. (902-678-2171)	(2)	CND
Rousselle, G. L., Canada Agriculture, Research Station, P. O. Box 457, St. Jean, Quebec J3B 6Z8, Canada. (514-346-4494)	(2)	CND

Rudolph, K., Institut fur Pflanzenpathologie und Pflanzenschutz, Grisebachstr. 6, 3400 Gottingen, West Germany. (393721) (2) BRD

Russ, K., Bundesanstalt fur Pflanzenschutz, Trunnerstrasse 5, 1021 Vienna, Austria. (0222-24.15.11) (3) OST

Ryugo, K., Department of Pomology, University of California, Davis, California 95616. (916-752-0929) (2) USA

Samson, Regine, Station de Phytobacteriologie, I.N.R.A., Route de St. Clement, Beaucouze, 49000 Angers, France. (41-87.69.97) (2) FR

Sanchezmonge, E., Departamento Genetica, Estac. Agronomos, Ciudad Universitaria, Madrid 3, Spain. (3) SPN

Sands, D. C., Dept. of Plant Path., Montana State Univ., Bozeman, Montana 59717. (406-994-4832) (2) USA

Sasser, M., Dept. of Plant Science, Univ. of Delaware, Newark, Delaware 19711. (302-738-2534) (1) USA

Schaper, U., Biologische Bundesanstalt, Institut fur Pflanzenbau im Obstbau, Postfach 73, 6901 Dossenheim ub. Heidelberg, West Germany. (2) BRD

Scheer, H. A. T. van der, Research Station for Fruit Growing, Brugstraat 51, 4475 AN Wilhelminadorp, The Netherlands. (01100-16390) (2) NL

Schmidle, A., Biologische Bundesanstalt, Institut fur Pflanzenschutz im Obstbau, Schwabenheimerstrasse, Postfach 73, 6901 Dossenheim/Heidelberg, West Germany. (06221-85238) (3) BRD

Schmidt, H., Pflanzenschutzamt des Landes Schleswig-Holstein, Westring 383, 2300 Kiel, West Germany. (1) BRD

Schroth, M. M., Department of Plant Pathology, University of California, Berkeley, California 94720. (415-642-4147) (1) USA

Schulz, F. A., Inst. fur Phytopathologie, Christian-Albrechts Univ., Olshausenstrasse 40-60, 2300 Kiel, West Germany. (0431-880-2996) (1) BRD

Seem, R. C., Department of Plant Pathology, N. Y. State Agric. Expt. Station, P. O. Box 462, Geneva, New York 14456. (315-787-2366) (2) USA

Seemuller, E., Biologische Bundesanstalt, Institut fur Pflanzenschutz im Obstbau, Schwabenheimerstrasse, Postfach 73, 6901 Dossenheim/Heidelberg, West Germany. (06221-85238)	(3)	BRD
Severin, V., Laboratory of Phytobacteriology, Research Inst. for Plant Protection, Blvd. Ion Ionescu de la Brad 8, Bucharest-Baneasa, Romania. (33.58.58-50)	(3)	ROM
Simonsen, J., State Experimental Station, Studsgaard, 7400 Herning, Denmark. (07-164111)	(2)	DK
Slack, D., Dept. of Plant Pathology, Univ. of Arkansas, Fayetteville, Arkansas 72701. (501-575-2446)	(1)	USA
Sobiczewski, P., Research Institute of Pomology, ul. Pomologiczna 18, 96-100 Skierniewice, Poland. (Skierniewice 34-21)	(3)	POL
Soledad, S. V., Tagum, North Davao, Philippines 9401.	(3)	PHI
Spotts, R. A., Mid-Columbia Expt. Station, 3005 Expt. Station Drive, Hood River, Oregon 97031. (503-386-2030)	(1)	USA
Stankovic, D., Horticulture Dept., Faculty of Agriculture, Univ. of Belgrade, ul. Namanjina 6, 11080 Zemun (Belgrade), Yugoslavia.	(3)	YUG
Stark, C., Pflanzenschutzamt, Slevogtstr. 48, 2800 Bremen 1, West Germany.	(2)	BRD
Starr, M. P., Department of Bacteriology, University of California, Davis, California 95616. (916-752-0283)	(1)	USA
Steiner, P., Department of Botany, Univ. of Maryland, College Park, Maryland 20742. (301-454-3816)	(1)	USA
Stushnoff, C., Department of Horticultural Science, Univ. of Minnesota, St. Paul, Minnesota 55101. (612-373-1030)	(2)	USA
Sugar, D., Southern Oregon Expt. Station, 569 Hanley Rd., Medford, Oregon 97502. (503-772-5165)	(2)	USA
Sutton, T. B., Department of Plant Pathology, N. C. State Univ., Raleigh, North Carolina 27650. (919-737-2752)	(2)	USA
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Valyi, S., Department of Plant Protect. and Agrochemistry, Ministry of Agriculture and Food Admin., Kossuth Lajos ter 11, Budapest, Hungary. (3) HUN

Vantomme, R., Laboratory for Microbiology, Ledeganckstraat 35, 9000 Gent, Belgium. (1) BLG

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Vogelsanger, D., Pflanzenschutzamt, Hermannswerder 20A, 15 Potsdam, East Germany. (3) DDR

Vondracek, J., Fruit Research Station, Techobuzize, 411 42 Ploskovice (okr. Litomerice), Czechoslovakia. (Ploskovice 9387) (3) CZE

Voronkova, L., Dept. of Bacteriology, Central Laboratory for Plant Quarantine, 1/11 Orlikov per., 107139 Moscow, B-139, Russia. (3) RUS

Vukovits, G., Bundesanstalt fur Pflanzenschutz, Vienna, Austria. (3) OST

Wade, E. K., Department of Plant Pathology, University of Wisconsin, Madison, Wisconsin 53706. (608-262-1426) (2) USA

Walsh, P., Dept. of Agriculture, Agriculture House, Kildare St., Dublin 2, Ireland. (789011, ext. 3289) (3) IRL

Way, R. D., Department of Pomology & Viticulture, N. Y. State Agric. Expt. Station, Geneva, New York 14456. (315-787-2235) (1) USA

Weaver, L. O., Department of Botany, Univ. of Maryland, College Park, Maryland 20742. (301-454-3816) (4) USA

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Wiggel, D., Ministry of Agriculture, Olantigh Road, Wyl, Nr. Ashford, Kent, England. (2) UK

Willett, M., Extension Service, Oregon State University, 1301 Maple Grove Drive, Medford, Oregon 97501. (503-776-7371) (2) USA

Williams, E. B., Department of Botany & Plant Pathology, Purdue University, West Lafayette, Indiana 47907. (317-749-6423) (2) USA

Wimalajeewa, S., Plant Research Institute, Burnley Gardens, Swan Street, Burnley, Victoria 3121, Australia. (8101511) (3) AUS

Yoder, K. S., Fruit Research Laboratory, Va. Polytech. Inst., 2500 Valley Ave., Winchester, Virginia 22601. (703-667-8330) (1) USA

Yorston, Y. M., Brit. Columb. Ministry of Agric., Research Station, Summerland, British Columbia V0H 1Z0, Canada. (604-494-7011) (2) CND

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Zoller, B. G., The Pear Doctor, Inc., P. O. Box 952, Yuba City, California 95991. (916-674-1255) (2) USA

Zwet, T. van der, U. S. Department of Agriculture, Appalachian Fruit Research Station, Rt. 2, Box 45, Kearneysville, West Virginia 25430. (304-725-3451, ext. 29) (1) USA

* * * * * * * * * * *

Working Group Membership by Country[1/]

Argentina	Bergna, D. A.	
	Dobra, A.	
	*Meyer, F. C.	
Australia	*Cartwright, D. N.	
	Jenkins, P. J.	
	Wimalajeewa, S.	
Austria	Russ, K.	
	Vukovits, G.	
Belgium	Deckers, T.	Luchene, K. van
	De Ley, J.	*Porreye, W.
	Geenen, J.	Vantomme, R.
	Laere, O. van	Veldeman, R.
Brazil	Bredemeier, D.	
	Feliciano, A. J.	
Canada	*Bonn, W. G.	Hunter, C. L.
	Cline, R. A.	Lane, D.
	Coulombe, L. J.	Letal, J.
	Crowe, A. D.	*McPhee, R.
	Davidson, J. G. N.	Muir, J.
	*Evans, I. R.	Quamme, H.
	Gibbins, L. N.	*Ross, R. G.
	Horricks, J.	Rousselle, G. L.
	Howard, R. J.	Yorston, Y. M.
Czechoslovakia	Kudela, V.	
	Paclt, J.	
	*Vondracek, J.	
Denmark	Andersen, H.	Jorgensen, H. A.
	Christensen, F. G.	Mosegaard, J.
	Dinesen, G.	Simonsen, J.
	*Jensen, A.	
East Germany	*Kleinhempel, H.	
	Muller, H. J.	
	Vogelsanger, D.	
England	Alston, F. H.	Fox, R. T. V.
	Bennett, R. A.	Gwynne, G.
	*Billing, E.	Lelliott, R. A.
	Byrde, R. J. W.	Wiggel, D.

[1/] Names with asterisk (*) are contact persons.

France	Large, M.	Ride, M.
	Lecomte, P.	Samson, R.
	Mathys, G.	Teissier, R.
	*Paulin, J. P.	Thibault, B.
	Petiot, J.	
Greece	Panagopoulos, C. G.	
	*Psallidas, P. G.	
Hungary	*Klement, Z.	
	Valyi, S.	
India	Gupta, V. K.	
Ireland	*Walsh, P.	
Italy	Bazzi, C.	Garibaldi, A.
	*Calzolari, A.	Mazzucchi, U.
	Ercolani, G. L.	Oberhofer, H.
	Fideghelli, C.	
Japan	Goto, M.	
	Kato, T.	
	*Okuse, I.	
Morocco	Benjama, A.	
Mexico	*Fucikovsky, L.	
Netherlands	Bouma, S.	Meijneke, C. A. R.
	Chron. Hort.	Miller, H. J.
	Heybroek, H. M.	Roosje, G. S.
	Kooistra, T.	Scheer, H. A. T. van der
	Langeslag, J. J. J.	Teylingen, M. van
	*Maas Geesteranus, H. P.	
New Zealand	*Dye, D. W.	
Norway	Dale, T.	
	*Roed, H.	
Philippines	Soledad, S. V.	
Poland	Burkowicz, A.	
	*Sobiczewski, P.	
Portugal	*Martins, J. M. S.	
Romania	Parnia, P.	
	*Severin, V.	

Russia	*Voronkova, L.	
South Africa	Button, J.	
	Erskine, J. M.	
	*Matthee, F. N.	
Spain	Lopez, Gonzalez, M.	Palazon, I.
	Mansergas, A. J. F.	Sanchezmonge, E.
	*Noval Alonso, C.	
Sweden	*Graberg, M.	Olsson, K. M.
	Kroeker, G.	
Switzerland	Bolay, A.	*Grimm, R.
	Egli, T.	Joseph, E.
Turkey	Baykal, N.	
USA	Abdel-Rahman, M.	Lombard, P. B.
	Aldwinckle, H. S.	Luepschen, N. S.
	Ark, P. A.	McSwan, I. C.
	Bailey, C. H.	Miller, R. W.
	*Barrat, J. G.	Morehead, G. W.
	Bates, J. J.	Mowry, J. B.
	*Beer, S. V.	Norelli, J. L.
	Bell, R. L.	Opgenorth, D. C.
	Berggren, J.	Otterbacher, A.
	Berry, D. W.	Pecknold, P. C.
	Beutel, J. A.	Preczewski, J. L.
	Biehn, W.	*Preiser, F.
	Blake, R. C.	Rackham, R. L.
	Burr, T. J.	*Ries, S. M.
	Bushong, J. W.	*Ritchie, D. F.
	Cameron, H. R.	Rom, R. C.
	Carlson, R. F.	Rosenberger, D. A.
	Carroll, V. J.	Ryugo, K.
	Chandler, D.	Sands, D. C.
	Civerolo, E. L.	Sasser, M.
	Clayton, C. N.	*Schroth, M. N.
	*Covey, R. P.	Seem, R. C.
	Crassweller, R.	*Slack, D.
	Cummins, J. N.	Spotts, B. P.
	*Davidson, S.	Starr, M. P.
	*Drake, C. R.	*Steiner, P.
	Egolf, D. R.	Stushnoff, C.
	French, J. R.	*Sugar, D.
	*Goodman, R. N.	Sutton, T. B.
	Harnish, W.	Swanson, B. T.
	Heimann, M. F.	Szkolnik, M.
	*Hickey, K. D.	*Thompson, J. M.

Hildebrand, E. M.
Hough, L. F.
Janick, J.
Johnson, D. E.
Jones, A. L.
Kado, C. I.
*Klos, E. J.
Koenigshof, R.
Kuc, J.
Lacy, G. H.
Lamb, R. C.
Landis, W. R.
*Thomson, S. V.
*Wade, E. K.
Way, R. D.
Weaver, L. O.
Westwood, M. N.
Willett, M.
Williams, E. B.
Yoder, K. S.
Zehr, E. I.
Zoller, B. G.
Zwet, T. van der

West Germany

Brulez, W.
Cornils, H.
Duben, J.
Franz, W.
Graf, H.
Hoppe, H.
Isenbeck, M.
Knosel, D.
Kraus, P.
Kuhne, H.
Lehmann-Danzinger, H.
Massfeller, D.
Meyer, J.
Michel, H. G.
Muller, K.
Ottermann, A.
Paetzholdt, M.
Persiel, F.
Prillwitz, H. G.
Reimann-Philipp, R.
Richter, J.
Rose, E.
Rudolph, K.
Schaper, U.
Schmidle, A.
Schmidt, H.
Schulz, F. A.
*Seemuller, E.
Stark, C.
*Zeller, W

Yugoslavia

*Arsenijevic, M.
Stankovic, D.

* * * * * * * * * *

SUMMARY

Contact Persons for Fire Blight Newsletter

United States

Arkansas	Slack, D.
California	Schroth, M. N.
Delaware	Davidson, S. H.
Georgia	Thompson, J. M.
Illinois	Ries, S. M.
Maryland	Steiner, P.
Michigan	Klos, E. J.
Missouri	Goodman, R. N.
New Jersey	Preiser, F.
New York	Beer, S. V.
North Carolina	Ritchie, D. F.
Oregon	Sugar, D.
Pennsylvania	Hickey, K. D.
Utah	Thomson, S. V.
Virginia	Drake, C. R.
Washington	Covey, R. P.
West Virginia	Barrat, J. G.
Wisconsin	Wade, E. K.

Canada

Alberta	Evans, I. R.
British Columbia	McPhee, R.
Nova Scotia	Ross, R. G.
Ontaria	Bonn, W. G.

Other Countries

Argentina	Meyer, F. C.
Australia	Cartwright, D. N.
Belgium	Porreye, W.
Czechoslovakia	Vondracek, J.
Denmark	Jensen, A.
England	Billing, E.
France	Paulin, J. P.
Germany (East)	Kleinhempel, H.
Germany (West)	Seemuller, E. Zeller, W.
Greece	Psallidas, P. G.
Hungary	Klement, Z.
Ireland	Walsh, P.
Italy	Calzolari, A.
Japan	Okuse, I.
Mexico	Fucikovsky, L.
Netherlands	Maas Geesteranus,H
New Zealand	Dye, D. W.
Norway	Roed, H.
Poland	Sobiczewski, P.
Portugal	Martins, J. M. S.
Romania	Severin, V.
Russia	Voronkova, L.
South Africa	Matthee, F. N.
Spain	Noval Alonso, C.
Sweden	Graberg, M.
Switzerland	Grimm, R.
Yugoslavia	Arsenijevic, M.

SUMMARY

Persons Interested in Fire Blight

Country	Interest Category 1	2	3	4	Total	Number of Contact Persons
* USA - United States	32	49		6	87	18
* CND - Canada	3	15			18	4
* BRD - West Germany	11	14	5		30	2
* NL - Netherlands	5	6			11	1
* FR - France	5	1	3		9	1
* UK - England	4	4			8	1
* BLG - Belgium	6	2			8	1
* DK - Denmark	3	4			7	1
* DDR - East Germany			3		3	1
* POL - Poland	1		1		2	1
* NZ - New Zealand		1			1	1
* MEX - Mexico		1			1	1
ITA - Italy			7		7	1
SPN - Spain			5		5	1
SWT - Switzerland			4		4	1
ARG - Argentina			3		3	1
AUS - Australia			3		3	1
CZE - Czechoslovakia			3		3	1
JAP - Japan			3		3	1
SA - South Africa			3		3	1
SWD - Sweden			3		3	1
YUG - Yugoslavia			2		2	1
GRC - Greece			2		2	1
HUN - Hungary			2		2	1
NOR - Norway			2		2	1
ROM - Romania			2		2	1
IRL - Ireland			1		1	1
POR - Portugal			1		1	1
RUS - Russia			1		1	1
OST - Austria			2		2	
BRA - Brazil			2		2	
IND - India			1		1	
MOR - Morocco			1		1	
PHI - Philippines			1		1	
TUR - Turkey			1		1	
TOTAL	70	97	67	6	240	50

*Countries with fire blight.

Fire Blight Mailing List Questionnaire

The list of names in this Newsletter is an annual attempt to establish a complete and updated mailing list of all persons interested in fire blight. Please make corrections and additions where necessary and send me any new names not listed. A new list will be prepared for the next newsletter.

☐ My name, address and telephone are correct (if not, show change below)

☐ My interest in fire blight is correct (if not, please indicate below)

☐ My name should be dropped from this list

☐ My/other name should be added to this list

NAME _____

ADDRESS _____

_____

_____ ZIP

TELEPHONE _____

Interest in fire blight research: 1 2 3 4

Interest in fire blight newsletter: YES NO

I will serve as contact person for newsletter questionnaire: YES NO

} Please circle one of each

Please return to your contact person or directly to:

T. van der Zwet
Appalachian Fruit Research Station
Route 2, Box 45
Kearneysville, West Virginia 25430